

## Phonetogram



The Phonetogram is a technique producing an evaluation of the vocal function in the form of an area made with the minimal and maximal intensities and notes emitted by a subject.

### Principle

Practically, the subject must pronounce a /a/ at thirty centimeters from a microphone, first a mean note, at the lowest intensity possible, then at the loudest intensity. These intensities are displayed in the ordinate of a diagram where the notes are placed in abscissa. The process is repeated, note by note in descending order, until the lowest frequency the subject is able to produce. And then in ascending order until the highest frequency possible, whatever the timbre of the subject. With a professional singer, the experience is repeated with the /i/ and /u/ vowels. This Phonetogram meets the international standard<sup>1</sup>, the scales are 40 to 110 dB for the intensity, and between 49 Hz to 1568 Hz in frequency.

## Preparation

### Equipment

Patient is standing up à 30 centimeters from the on-stand microphone. Verify carefully the distance with a ruler or a thread attached to the microphone.

Turn the selector **INPUT 1-LEFT** on **MICRO**.

### Software

Launch the SESANE software by clicking this icon in Windows task bar.



In SESANE, enter the patient information :



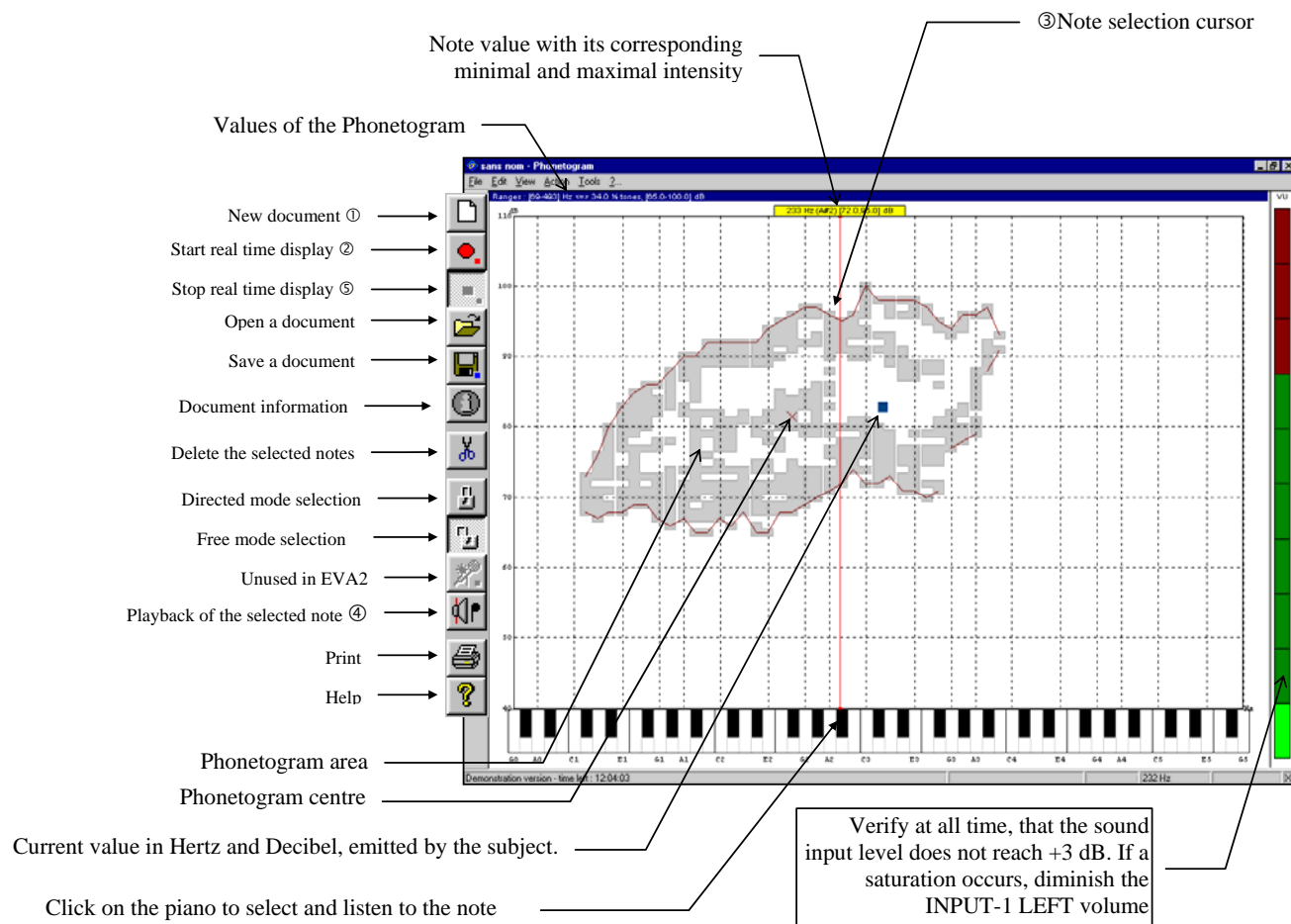
Patient Informations

Double click on this icon :



<sup>1</sup> H.K.Schutte, W.Seidner, 1983, « Recommendations by the Union of European Phoniaticians (UEP) : Standardizing Voice Area measurements/Phonetography », Folia phoniatic., 35 , 286-288

## Using Phonetogram



### Protocol

- ① Create a new document if necessary
- ② Start real time display: *At this moment, all the notes emitted by the subject are displayed at screen in real time..*

### In directed mode

- ③ Move the selection cursor at the position corresponding to the studied note. To do so, click on the cursor and move the mouse while maintaining its left button down.

- ④ Listen to the selected note.

The patient reproduces the note. The detection of the note and the detection of the lowest and loudest intensity is automatic. The Phonetogram shape appears gradually.

**Remark : the shape appears after the second note tested.**

Repeat the operations in ③ until the Phonetogram is completed.

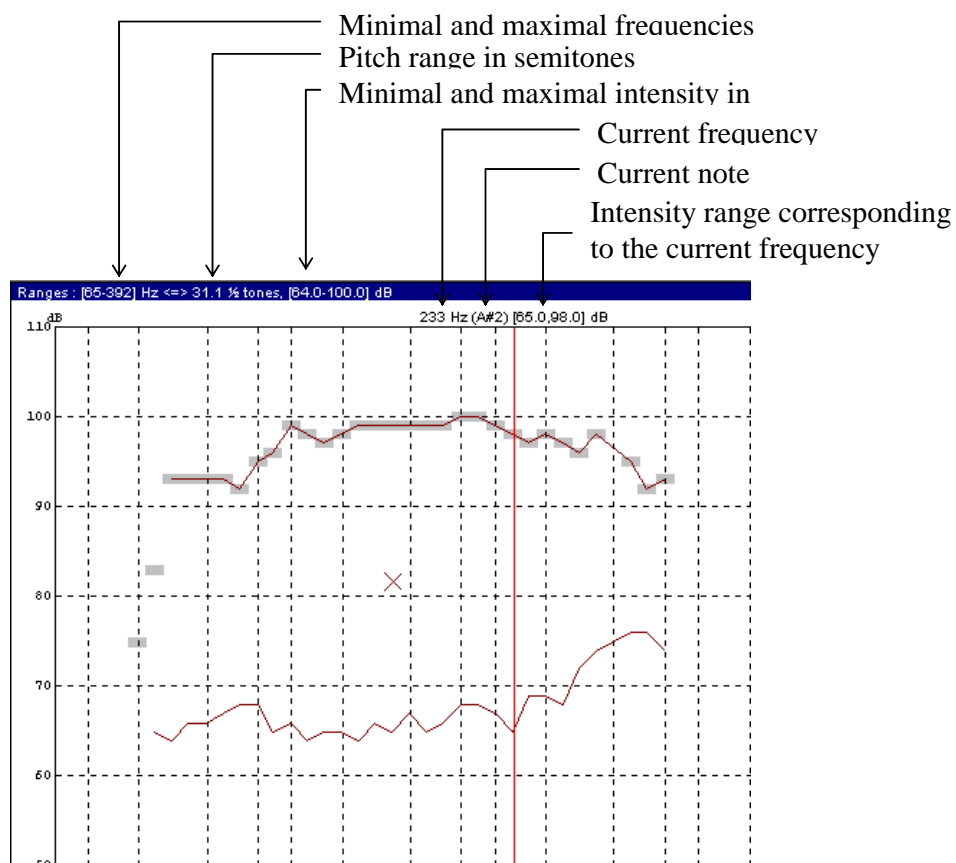
### In free mode

The patient must sing in glissando, at different intensities. Each note produced is immediately validated and remains displayed at screen. This method is, of course, much faster.

- ⑤ Stop real time display.
- Save the document.
- Print the document.


## Measurement

### Measures

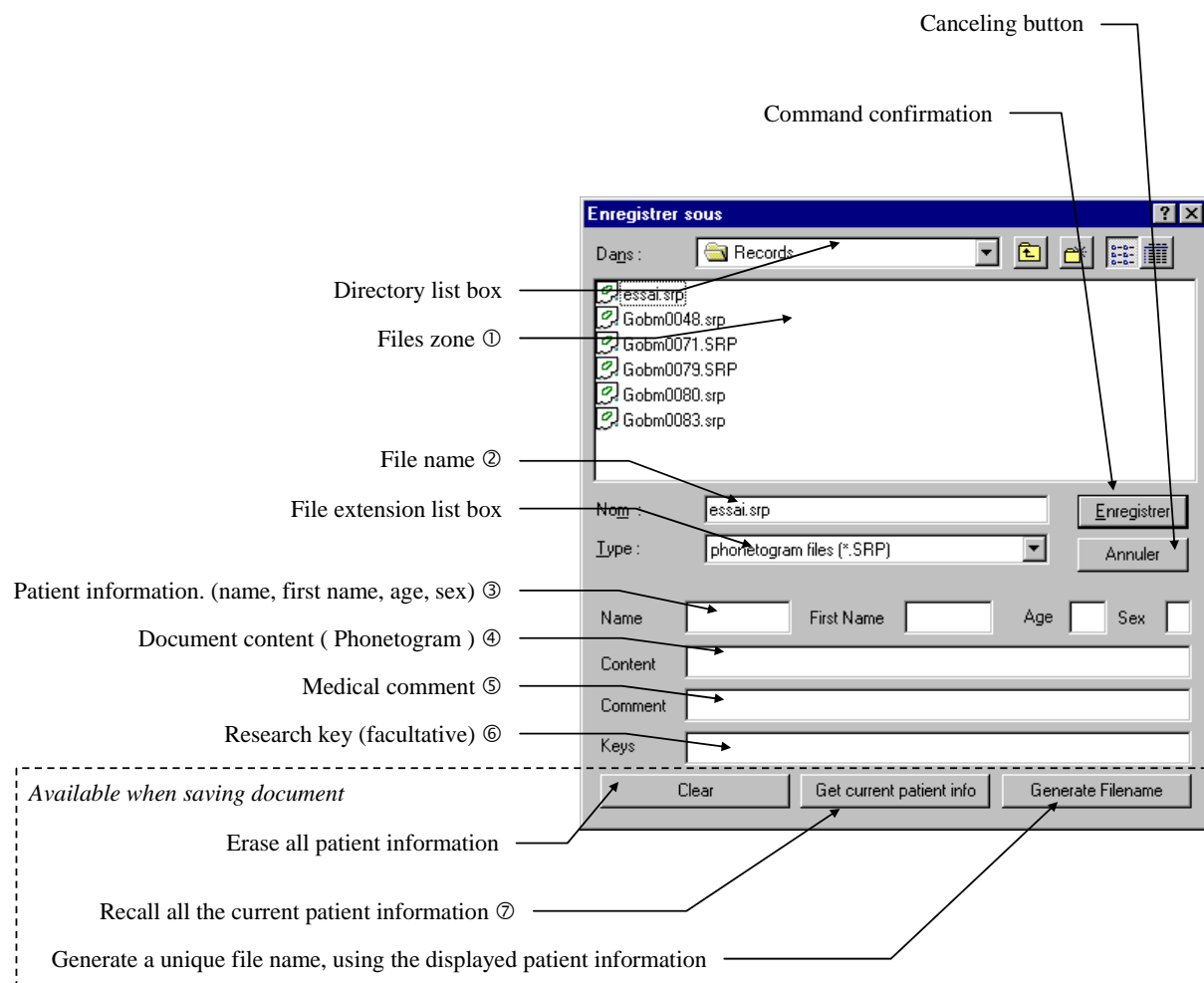


### Editing Phonetogram

For deleting incorrect points :

1. Select a zone in the graph :
  - hold down the SHIFT key
  - move the mouse with the left mouse button down
2. To cut the selection :
  - Click the scissors icon ()
  - or use the DELETE key
  - or use the menu Edit | Cut selected Frequencies

## Data Management



### Save a document

Method 1 : Click on ⑦. The current patient information appear in the fields ③, ④, ⑤, ⑥. A unique filename is automatically generated in ②. Confirm by clicking on ⑨.

Method 2 : Enter manually the patient information in the fields ③, ④, ⑤, ⑥. Click on ⑧. A unique filename appears in ②. Confirm the saving by clicking on ⑨.

Method 3 : Enter manually the patient information in the fields ③, ④, ⑤, ⑥. Enter a file name in ②. Confirm the saving by clicking on ⑨.



### Open a document

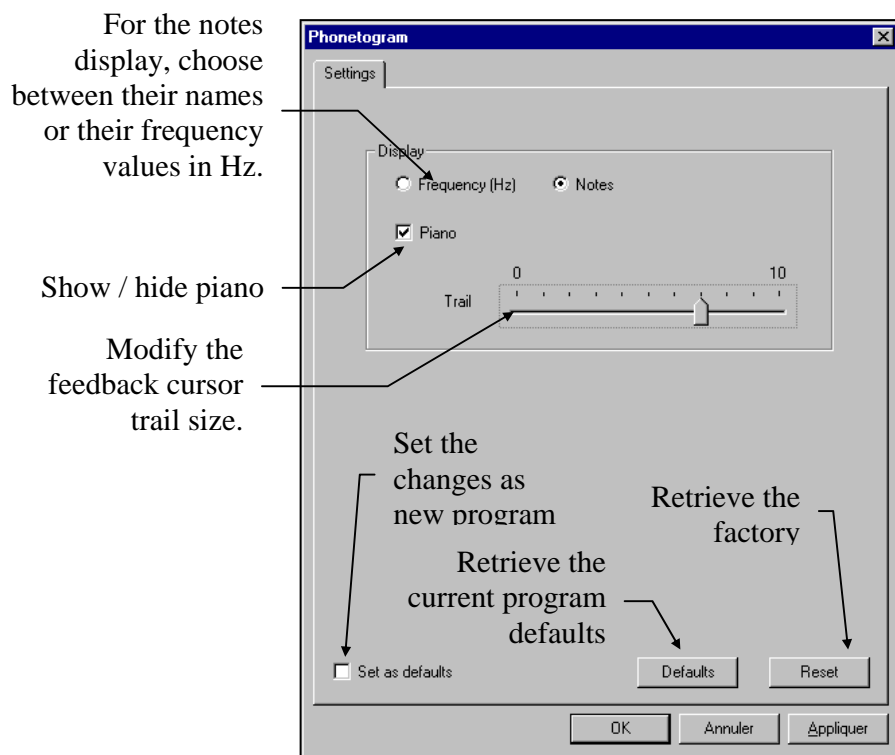
Select a document in ① by a single click with the left mouse button.. The file name appears in ② with its information as well in ③, ④, ⑤ ⑥. Confirm your choice by clicking on ⑨.



### To obtain information about the current document

## Options

You can modify the program parameters by selecting the menu « Tools | Options » or by typing the « O » key.

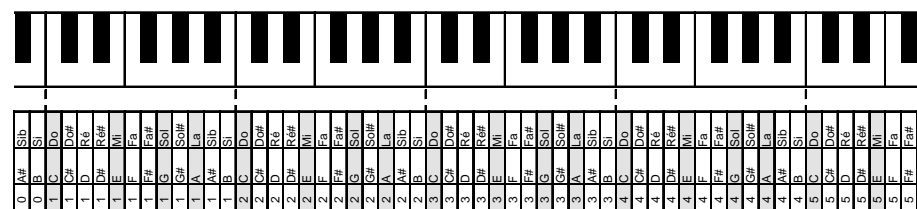


## Technical Notes

Generally it is not necessary to test all the notes of the scale. By convention, the notes Do, Mi, Sol have been chosen for the different octaves. They are signaled by dashed lines on the graph. (see the correspondence table below).

It is however possible to test each note of the scale if necessary. To do so, simply move slightly the selection cursor, until a change occurs in the frequency displayed on top of the cursor. Inversely, to shorten the exam length, the manipulator can choose to test only a few notes.

*Correspondence table between notes (in semitone) and their frequencies*



Memo :

- $Range \text{ (in } \frac{1}{2} \text{ tones)} \approx 40 \cdot \log_{10} \left( \frac{Freq_1 (Hz)}{Freq_2 (Hz)} \right)$
- 1 octave = 12  $\frac{1}{2}$  tones

